[redacted]

17 September 1964
AEG:is-74

[redacted]
P. O. Box 9642
Rosslyn Station
Arlington, Virginia 22209

Subject: Contract [redacted]

Enclosure: (1) Three Copies of Sixth Monthly Progress Report, August 1964

Dear Sir:

In accordance with the terms of this contract, we submit as enclosure (1) three copies of a progress report for the month of August 1964.

As of 30 August 1964, our expenditures and commitments total [redacted] against the total contract cost limit of [redacted]

Very truly yours,

[redacted]

16 September 1964
GS:bb:413
(997-112)

SIXTH MONTHLY PROGRESS REPORT

AUGUST 1964

MICRODENSITOMETER CAPABILITY AND INTERPRETATION STUDY

This report covers the sixth month's activities on a study of microdensitometer capability and interpretation techniques. The objectives of the program are: (1) the establishment of techniques which will enable a microdensitometer operator to use the instrument to its maximum capability and to interpret the data therefrom accurately (these techniques are to be contained in a handbook of microdensitometry), (2) a survey of existing instruments to determine the most recent developments in microdensitometry, and (3) a study of the feasibility and effectiveness of various advances in the state-of-the-art.

Each of the three tasks has been continued during the reporting period. As of the end of the month, the percentage expenditure to date was 76%.

I. Mensuration Procedures and Data Interpretation

The primary emphasis on Task I has been on mensuration procedures, resolution and light source coherence effects, and grain scattering effects on density determination.

The mensuration procedures are being written in the form of a handbook. These procedures include data acquisition, reduction, analysis and interpretation.

The investigation of instrument resolution and light source coherence effects has been completed. The completion of this investigation is presented in Attachment 1 to this report.

The study of the dependence of measured density on source and detector specularity was concluded with the measurement of "diffuse density." The results of this part of the study are presented in Attachment 2. Some omissions were discovered on a previous memo: "Variation of Density with Numerical Aperture." Attachment 3 covers these omissions.

II. Equipment Capability

Three trips were made to equipment manufacturers during the month:

1. To the National Instrument Laboratories, Rockville, Maryland, STAT to evaluate the [redacted] microdensitometer, described more fully in Attachment 4.

STAT 2. [redacted] to obtain information on the automatic focussing device, described in Attachment 5.

STAT 3. [redacted] to evaluate the [redacted] STAT
STAT [redacted] described in Attachment 6.

There are two more instruments to be evaluated, the Intectron and the Ansco "Class I." Neither of these instruments is currently available at its manufacturer's facilities, so these trips may be delayed until they are available, or some other arrangement, such as visiting customers' facilities, may be made.

A tabulation is being made of all the instruments' characteristics and special features.

III. Feasibility Studies

The analysis of sine wave and edge test patterns has been completed. The results of this study show agreement between the two test techniques for 2 out of 3 sine wave frequencies tested. The lowest frequency sine wave pattern, when tested, was found to have unwanted harmonics making it impossible to determine its exact modulation. The results of this study are included in Attachments 7 and 8.

The results of an investigation of the improvements possible in the recording of edge traces by using narrow illuminating apertures and laser light sources is included in Attachment 1.

STAT

Some of the "neutral density" filters which are being used in the microdensitometer survey evaluation tests were calibrated using the [ ] STAT [ ] Spectrometer. The results of this effort are presented in Attachment 9. It is our present intention to have some of these filters checked by the National Bureau of Standards.

In order to obtain information necessary for the use of the optical system STAT of [ ] Ansco Model 4 Microdensitometer, a call was placed to the optics STAT manufacturer, [ ] It was learned that the information requested is either Company Confidential or not immediately available, and engineering time would, therefore, be required. As of the end of the month, no data have been received.

[ ] STAT

ATTACHMENTS

1. Influence of Coherence Upon Images in the Microdensitometer [redacted] RK:bb:406 31 August 1964

2. Continuation of Study to Determine Density Variation with Numerical Aperture [redacted] WT:bb:401 31 August 1964

3. Errata - (Memorandum from H. Hammill To G. Snider dated 31 July 1964, HH:bb:362) [redacted] HH:bb:386 25 August 1964

4. Trip Report to National Instrument Laboratories, Rockville, Maryland on 6 August 1964 [redacted] MM:bb:385 25 August 1964

5. Trip Report to [redacted] on 18 August 1964 [redacted] MM:bb:387 25 August 1964

6. Trip Report to [redacted] on 20, 21 August 1964 [redacted] MM:bb:400 31 August 1964

7. Evaluation of Microdensitometer Resolution Characteristics by Sine Wave and Edge Trace Techniques [redacted] JS:bb:407 31 August 1964

8. On the Relationship Between Sine Wave Modulation and Some Coherent Optical Filtering Measurements [redacted] ET:bb:373 13 August 1964

9. Calibration of Neutral Density Filters [redacted] WT:bb:405 31 August 1964